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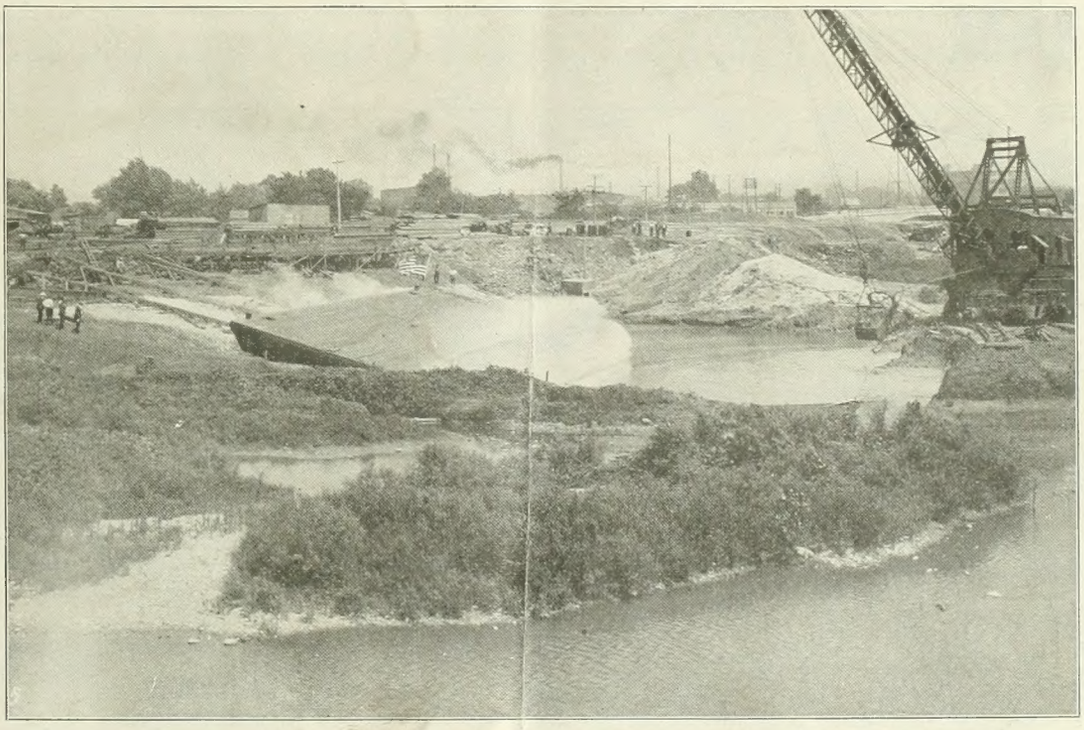
LIBERTY LOAN NUMBER

October 1918



LAUNCHING A SCOW INTO THE MIAMI RIVER AT DAYTON

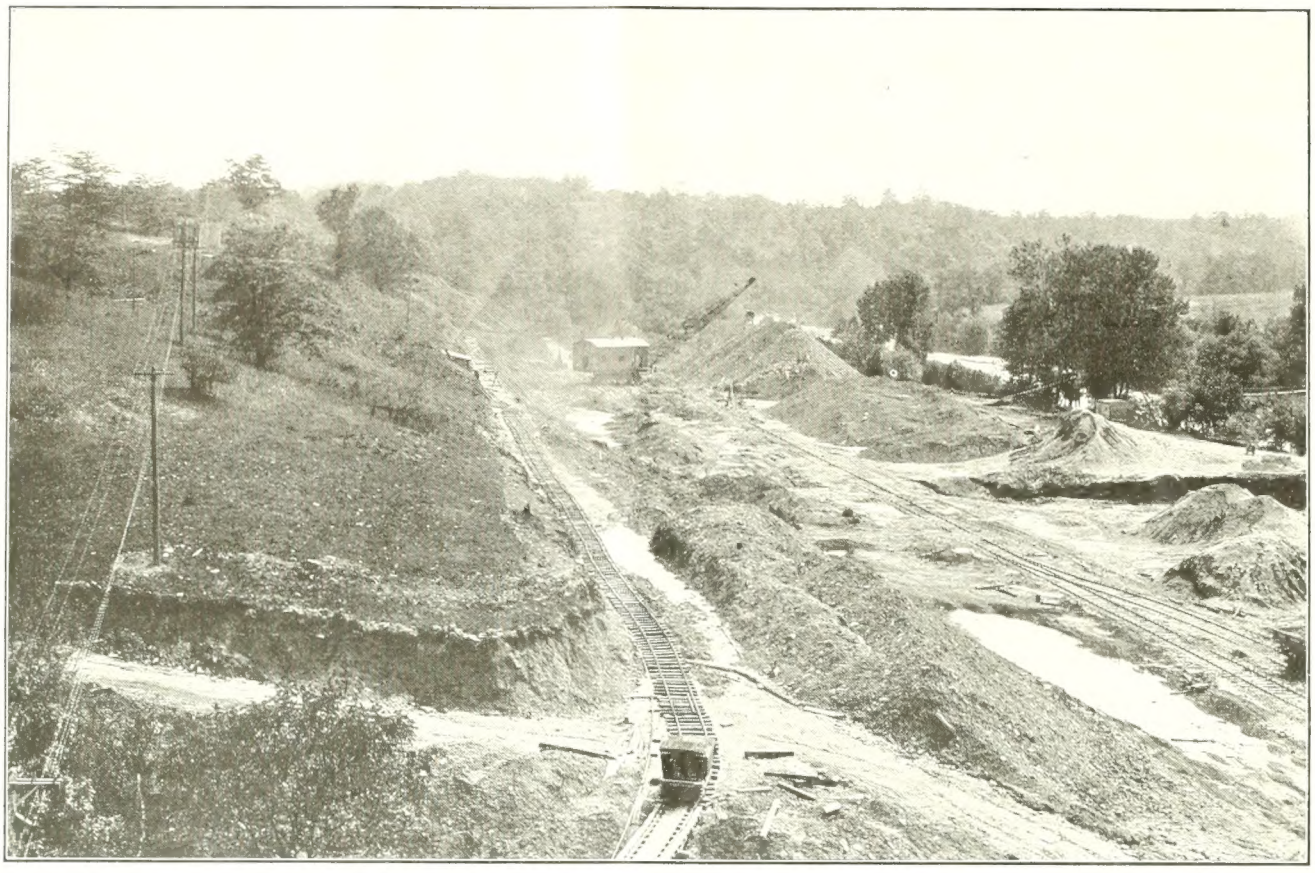


FIG. 38—GENERAL VIEW OF THE GERMANTOWN DAMSITE, FROM TOP OF GRAVEL PLANT

The dragline is excavating for the down stream end of the concrete outlet conduits. The excavated material which is not suitable for use in the dam is hauled away on the track at the right. Concrete for the outlet foundations will be hauled on the track at the left. The conduits will run parallel to the present position of the two tracks. They will be built in a dry trench, whose upstream and downstream ends will then be connected with the present creek.

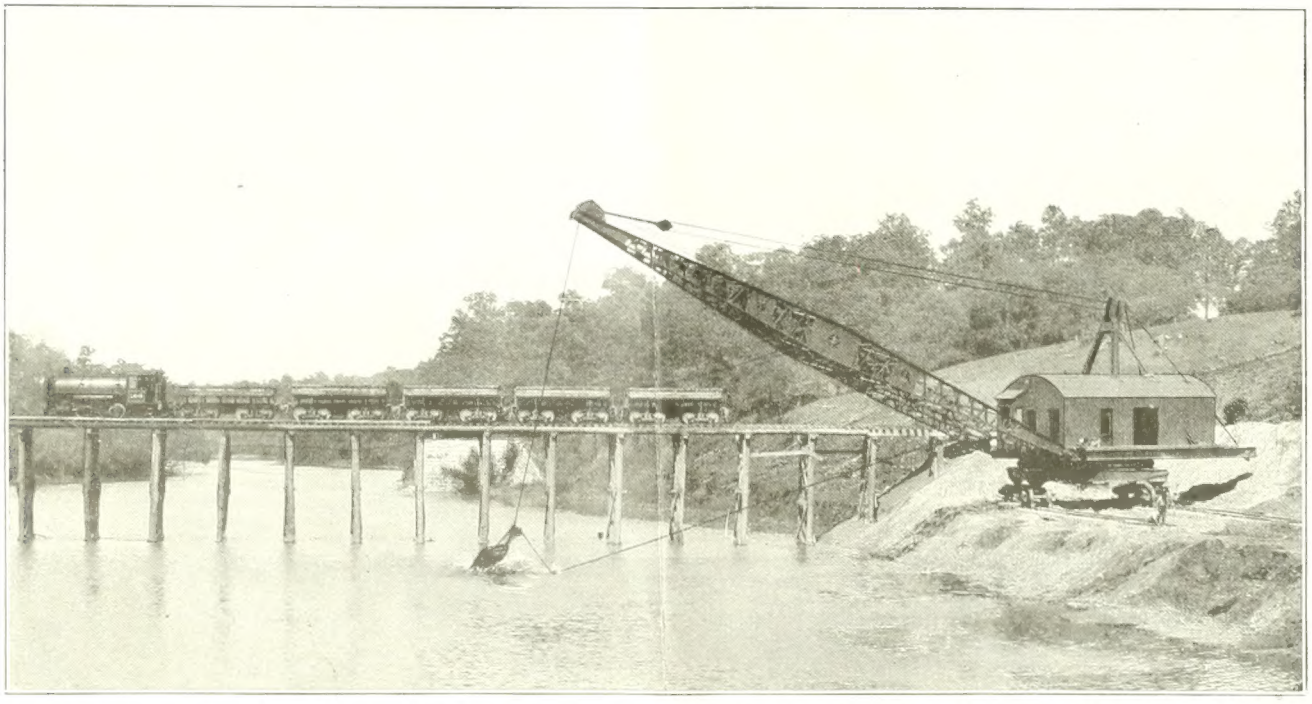


FIG. 39—LIDGERWOOD DRAGLINE EXCAVATING CUT-OFF TRENCH IN THE MIAMI RIVER

Shows how the dragline adapts itself to river excavation. The bucket is just dropping into the water. The dragline runner has thrown it out as a trout fisherman casts a fly, about fifteen feet beyond the bottom end. In favorable circumstances this distance can be increased to about 40 feet. (The boom shown is 100 feet long). The river here was deepened to a depth of twenty feet. Scene is at Taylorsville.

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THE

MIAMI CONSERVANCY BULLETIN

PUBLISHED BY THE MIAMI CONSERVANCY DISTRICT

DAYTON, OHIO

Volume 1 October 1918 Number 3

The Fourth Liberty Loan

Today on the soil of France there stand 1,750,000 American soldiers, facing the German Rhine. They are there to fight. They are there to pay the obligation which, in common with you and me, they owe to the America which bred them and brought them up. It is a debt that you and I and every one of us owe to this great land of ours, whose blessings, like the sun and air, have become so common that we forget the obligation they lay us under. But the men in France do not forget. They remember the obligation. They pay the debt with their blood. They pay it for you and me.

What on our part can we do in return?

We can pay the debt with our money. That is the least we can do. There is a sense of shame which comes at times, I believe, to all of us, to think that we only pay money, where they over there pay blood. Those men bear wounds for me, endure death for me. What is the trifle that I do, this handful of money I give for them? I do not even give it. I loan it; I lay it away at profitable interest in the safest treasury vault in the world, against my future needs; while they go down to their graves. It is a wholesome and humbling thought, which ought to be with every one of us, day by day in these times, as we face this fourth call to do the little we can do, the loaning of a handful of money for them to use, while they fight the battle for liberty, which is the battle for us all. It is well for us to dwell much on that thought, and as it comes to us, to cast our money in "without stint or limit" till the victory is won.

The Conservancy Work An Essential Industry

The District Exemption Board with headquarters at Cincinnati has just made a ruling which places the work of the Miami Conservancy District in the class of necessary industries. The following extract from their letter speaks for itself:

"Replying to your letter of September 16th would advise that, after carefully considering the evidence as submitted in your letter, together with copy of letter of December 6th from the Treasury Department, the District Board will recognize the Miami Conservancy as a necessary industry.

"It will, however, be necessary for you to file an industrial claim for each employee for whom you ask deferred classification, and each case will have to show this man is necessary to the enterprise and cannot be replaced without material loss to the Government and your work."

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Subscription to the Bulletin is 75 cents per year. At news stands 10 cents per copy. Business letters should be sent to L. F. Wilcock, Assistant Engineer, Miami Conservancy District, Dayton, Ohio. Matter for publication should be sent to G. L. Teeple, Miami Conservancy District, Dayton, Ohio.

Getting Together the Equipment

The Crisis Which Developed As the Work Was About to Begin—How Difficulties Due to Heavy Demands on the Machinery and Supply Market Were Overcome.

The work of the District includes two distinct jobs; first, the building of the five great protecting dams; and second, the deepening and widening of the Miami River channel through the cities. Each involves the moving of earth in large quantities. To construct any one of the dams means the digging, transporting, depositing, and compacting of 850,000 to 4,000,000 cubic yards of earth. For the river the figure is more than 4,000,000 cubic yards. Dams and river together will mean the excavation and transportation in all of some 13,000,000 cubic yards.

Last January none of the machinery and equipment necessary for this great task was on the ground. During three and a half years of war, American manufacturers had been engaging more and more energetically in making supplies for the Allies. Our own entry into the conflict had immensely stimulated this activity. Equipment and materials had grown exceedingly hard to obtain and were becoming ever harder. The demand on labor had increased to an equally serious degree.

Thus when the period of construction approached a serious question arose. It had been expected to do the work in the ordinary manner, by contract. But the conditions just referred to had by this time become so serious that it became practically impossible to get contractors to do the work. The risks were too great. To protect themselves, their bids would have to be so high that it would be better for the Conservancy District to go ahead and do the work on its own initiative. This course was therefore adopted. To aid them the Conservancy Engineers secured the services of Mr. C. H. Locher, a contractor of unusual ability, experience and resource, to manage the construction work.

At the beginning of 1918, then, the Conservancy Engineers and Mr. Locher found themselves quite suddenly in the market for the purchase of machinery and equipment whose larger items alone have since totaled over $1,500,000. There were pessimists who shook their heads at this. They declared that the machinery could not be obtained, or if it could be, only after long delays and at prohibitive cost. They declared that the entire project ought to be indefinitely postponed.

The Board of Directors of the District, however, after carefully considering the matter from various angles, determined that the risk involved in delay was so great that they ought to go ahead. The project was one of great public importance. It involved the safety of many millions of dollars' worth of property, including many important war industries. In case of another great flood, it involved the possible loss of hundreds of human lives. The Directors had previously put themselves in personal touch with the Priorities Committee of the War Industries Board at Washington and had secured their interest in the project. In December, 1917, Col. Deeds wrote the Secretary of the United States Treasury a frank statement in regard to the financing of the project, and obtained his personal approval in the matter.

The Engineers had put very careful study on the various types of equipment needed. The chief items, as has been indicated, concerned the ma-

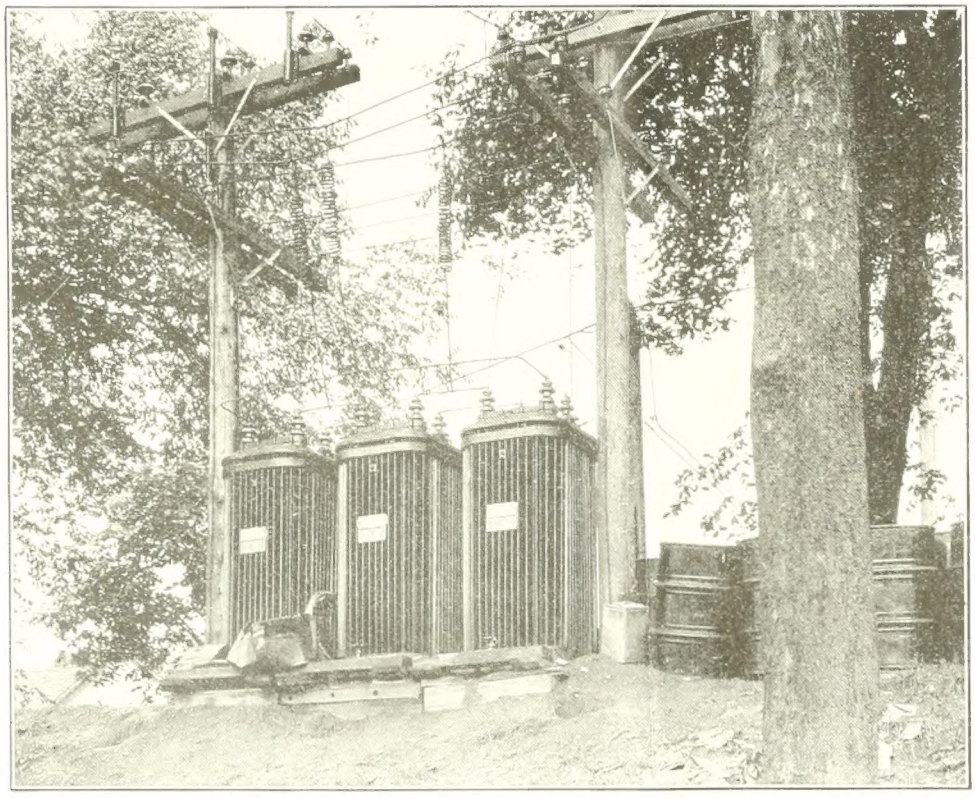


FIG. 40—BIG TRANSFORMERS FURNISHING POWER TO THE DRAGLINE EXCAVATORS IN DAYTON

These transformers take current from the Dayton Power & Light Co., at 6600 volts, and deliver it to another set at 2300 volts. These again deliver it at 440 volts to the machines. The poles, trees, and gasoline barrels give a measure of size. The transformers will deliver 600 kilowatts (806 horse power) of electrical energy.

chinery for excavation and transportation. In excavating machines they had, broadly speaking, the choice between draglines, steam shovels, and dredges. Under certain conditions, several of which were present in connection with the Conservancy work, the hydraulic dredge furnishes the cheapest and most efficient method of excavation. By this method of construction, the earth, together with about ten times its volume of water, is picked up by the suction pipe of the dredge pump, and the mixture pumped to the point desired, where the water is permitted to run away, leaving the earth behind it. For filling wide, flat, low areas adjoining streams or lakes, and where the material is suitable, no other method equals this. Its advantages are so great that in modified form, in what is known as the method of "hydraulic fill," it has been applied to earth dam construction. In this application it is one of the latest developments of engineering science, making not only a cheaper dam but a better one. For these reasons the dredge pump has been chosen for a considerable part of the embankment work.

For the greater part of the excavation, however, the dragline excavator was chosen. Something of the history and advantages of this machine, which is also a development of recent years, will be given elsewhere in this issue. It was chosen for its great flexibility, wide range, long reach, and its ability to dig efficiently and cheaply either in water or out of it, and at a level far below that on which the machine stands. Another reason was that after the work is done, the dragline equipment, costing hundreds of thousands of dollars, can be easily disposed of, and its cost thus largely salvaged.

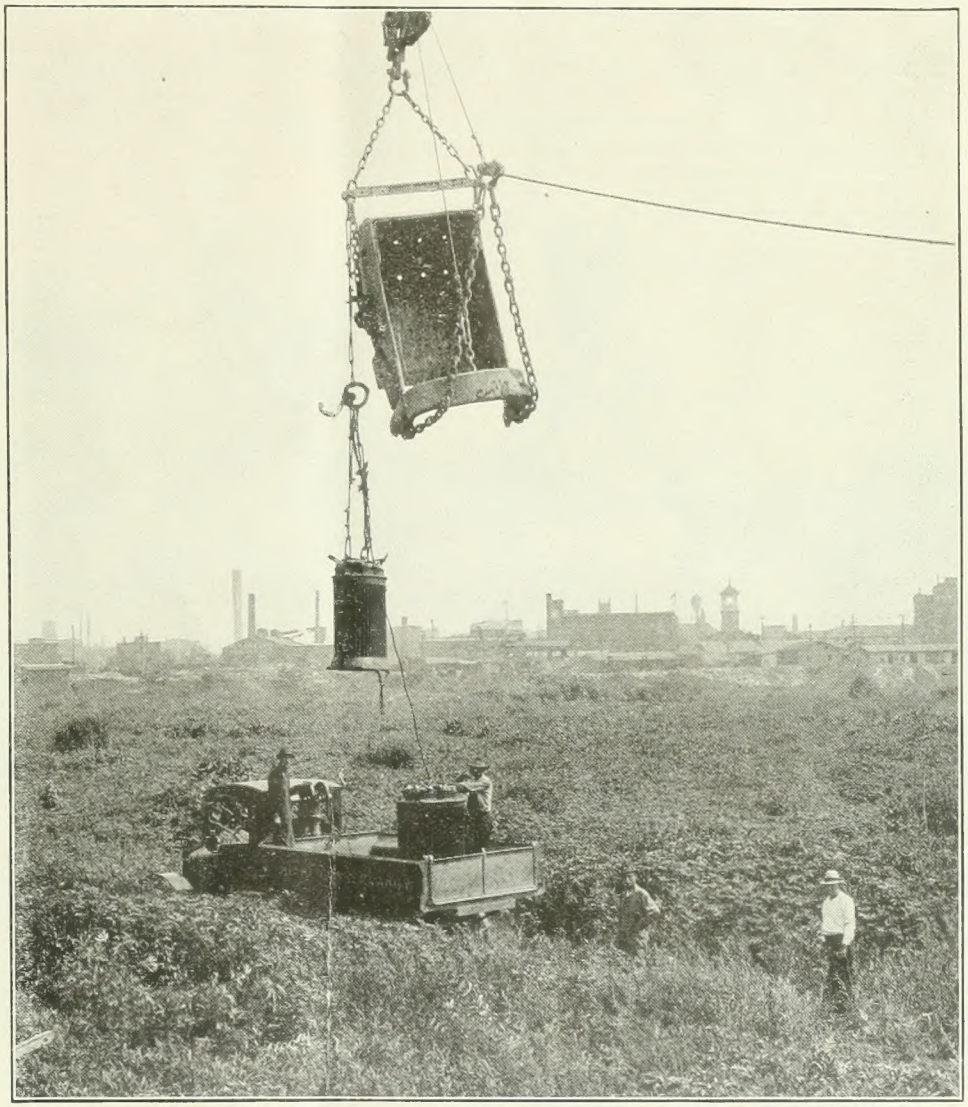


FIG. 41—A BIG DRAGLINE USED AS A DERRICK

The machine itself is not seen; only the bucket, hanging in midair, with cables hung from one corner which carry a big alternating current transformer. The transformer has just been lifted by the dragline out of the five-ton truck below, and will be swung into position at the point where it is to be set up.

It was determined to secure for most of the work electric draglines. Steam machines involve the problems of transporting coal, and of loading it into the machines while they are operating, which interrupts work. Moreover, the Dayton Power and Light Company had just completed a new station furnishing ample electric power, which could be carried over transmission lines to all parts of the District.

The electric dragline being a new type, it was possible to get track of practically every one that ever has been built. The principal manufacturers are the Lidgerwood, the Marion, and the Bucyrus Companies, and machines of all these makes were obtained. Several partly built Bucyrus steam draglines were altered so as to use electric power, while they were in the shops. Several second-hand machines in good order were also secured. By a thorough search, which uncovered practically every electric dragline which was in use or building in the United States, a sufficient number were secured of all the various sizes necessary.

The search for these machines is itself a story of great interest, too long to be more than suggested here. To inspect one of the big Bucyrus machines now at Hamilton, Fowler Smith, the Purchasing Agent of the District, and "Big Bill" McIntosh, the Master Mechanic, waded through four feet of January snow in northern Michigan, where the drag-

line had been working in an open mine. To get it to the railway a gang of men shoveled snow six feet deep for four days, and for a distance of a quarter of a mile, with the thermometer thirty-five degrees below zero. The three Lidgerwood machines were also dug out of snow in much the same sort of weather, on the drainage canal near Chicago. Two other draglines, and these among the largest ever manufactured, were dragged out of the swamp in southeastern Mississippi. Such difficulties, whether physical or of other kinds, were never allowed to stand in the way. The search was indeed pursued so vigorously that the engineers found they had one more dragline than they needed; but this caused no worry, since to dispose of a spare dragline was a very easy matter.

In all, eighteen draglines were bought at a total cost of about $425,000, and are now at work. Eight of these use steam. Where a dragline, as in some cases at the dams, does a good deal of moving about, it is better if it can carry its own power. Moreover, to have waited in all cases for electric draglines would have delayed the work.

Locomotives and cars proved comparatively easy to secure. The engines principally desired were the forty and fifty-ton sizes of the standard gage, saddle-tank type. These, rather curiously in the present state of the machinery market, were not in great demand at the time, and there was sharp competition among the locomotive men for the Conservancy business. The order, for thirteen engines, went in the end to the American Locomotive Works. Six small 3-ton gasoline locomotives of twenty-four inch gage, for hauling concrete from the mixers, were obtained from the J. D. Fate Co. A second-hand 18-ton Porter saddle-tank engine was also bought, making twenty locomotives in all.

To go with these, 81 standard gage 12-yard Western dump cars were secured, and eight of the 4-yard size, and of 3-foot gage. For the concrete a dozen 1½-yard hopper cars were bought.

Dredge pumps proved a harder problem, the few firms engaged in their manufacture being busy with war work. Fortunately these were not immediately needed. They were finally obtained from the United Iron Works and the Byron-Jackson Co. of San Francisco, and the Morris Machine Works and the American Manganese Steel Co. in the east. It is worth noting that the Pacific coast people, although so much farther away, have beaten the eastern firms in shipment, their machines being already on the ground and sufficient in number for the present need. Water pumps have been furnished by the Cameron Pump Works, the Allis-Chalmers Co., and the Gould Co., the latter supplying the five units needed for camp water supply. All of these pumps use electric power.

To carry water for the hydraulic fill at the dams some 12,000 feet of steel pipe will be required. About half of this has been obtained from the American Rolling Mills at Middletown, Ohio. The remainder came from the Thompson Iron Works and

FIG. 42—4½ YARD BUCKET OF THE BUCYRUS CLASS 175 DRAGLINE AT HAMILTON

The same bucket shown in figure 43. The men are tall men. The picture shows clearly the attachment of the two cables, the loading cable at right, and the hoisting cable, barely seen, passing round the big pulley at the top. The bucket is standing on its nose, held erect by the hoisting cable.

the American Spiral Pipe Co., the latter for the high pressure lines connecting with the "giants" used in the hydraulic fill. About eight miles of cast iron pipe was also bought for the water supply to the various camps.

The five gravel washing plants, needed for the concrete work at the dams, there was no special difficulty in obtaining. Various manufacturers suggested layouts, the one presented by the Raymond W. Dull Co. being finally adopted, a design practically uniform at all of the dams. The concrete mixers connected with these plants were purchased from the Smith Co. of Milwaukee.

More trouble was anticipated in getting the electrical equipment than with any other, but by persistent search and following up of orders, it has been obtained as rapidly as it has been required for use. This was due in large part to the hearty co-operation of the local agents of the large electric manufacturing companies. The Dayton Power & Light Co. also helped greatly by arranging for special power lines. These have been extended from its system to all the large centers of activity in the Conservancy District. This company has also loaned motors and transformers to the District to help tide over needs which could not be met immediately by manufacturers, the Conservancy Engineers having had a closer call on this equipment than on any other.

The determination of the Conservancy Engineers and Directors to go ahead, in spite of the equipment difficulties, has been thus amply justified by the outcome. When the needs of the District were properly brought to their attention, manufacturers and dealers have been friendly in filling them. The problems have been to obtain just the equipment wanted, to get it quickly, and at a reasonable price. They were very live problems, to solve which took the greater part of the time of Charles H. Paul, the Assistant Chief Engineer, and C. H. Locher, the Construction Manager, for three solid months.

Steam Shovel Versus Dragline

The Advantages of Each, and Why the Dragline Was Chosen for Most of the Conservancy Work.

Among the most important and effective machines at work in the Conservancy District are the dragline excavators. They have cost more money, and are staged to do a bigger share of the work, than any other single type of mechanism. There are eighteen of them now operating, all but one owned by the District, and costing a total of about $425,000—more than a quarter of the total investment in large equipment since the work began.

Something was said in the article on equipment as to why these machines were chosen, and it may be of interest to go more fully into the matter.

There are many types of excavating machines, of which the best known is no doubt the steam shovel. These machines can now be bought in a great range of standard sizes, from the smallest, such as are used for cellar excavation or light grading, to a huge machine with a boom sweeping a radius of 100 feet or more, and carrying a dipper that will hold five wagon loads of earth.

In its own field nothing can surpass the steam shovel. It is compact, powerful and fast. It will work in all kinds of soil—even rock if not too solid. It has, however, some disadvantages. Its reach is very limited. It cannot, unless especially constructed, dig far below its track or place earth far above its base. This difficulty is adherent in the mechanism, as a study of Fig. 44 will show. The dipper, which appears thrust out over one of the cars, is carried at the end of an oak and steel dipper handle. The dipper handle works through a slot in the projecting boom, the two together forming a sliding and jointed mechanism which works much like the human arm. The dipper is the cupped hand, the dipper handle the forearm, the upper part of the boom the upper arm, the elbow being the wheel which shows at the center of the boom. If the human forearm were telescoped so that it could be lengthened and shortened, the parallel would be very close. The boom being fixed in position with respect to the steam shovel platform, the depth of digging is determined by the length of the dipper handle, and becomes a maximum when the dipper is directly under the wheel referred to. The excavating in fact is done as the dipper swings out and up from this position, on the wheel as a center. The marks of the dipper teeth in the bank at the left in the picture show this motion.

It will be clear by a little study that such a machine is not adapted to deep digging. It is efficient only on such a job as it is working at in the picture—digging away a bank, as in a railway cut. There it is very efficient. That is why nine of them are at work on the Conservancy railway relocation. But it cannot reach the bottom of a ditch or river. To excavate in water it must be mounted on a scow and set afloat. Then it becomes a dipper dredge. Even when transformed into a dredge, however, it is subject to the same limitation—it cannot dig deep, nor reach far out.

Just there lies the great advantage of a dragline excavator. This machine works on a totally different principle. It is a development of the slip scraper, with steel cables and steam engines in place of man power, leather tugs and mules. Imagine a very heavy slip scraper hung at its rear end by a cable from the upper end of a projecting boom (see figure 43) and with a second cable attached to the front end of it in place of a team, both cables running back around drums on the same revolving platform which carries the boom, and you have the essentials of a dragline excavator. The first is the **hoisting** cable; the second the **loading** cable.

How it loads its bucket is shown clearly in figure 45. There the loading cable, at the right, is pulling the bucket toward the machine. The hoisting cable, above, lifts on the rear end just hard enough to tilt it up and cause the cutting edge in front to dig into the earth and fill the bucket. By adjusting the pull on the hoisting cable, the bucket can be tilted at any

desired angle to take its load. In figure 43 a loaded bucket is shown just coming up out of the water. This figure shows clearly also the ingenious bridle rope used while hoisting the bucket, to keep it from turning upside down, as explained under the figure.

The wide reach of a dragline bucket is clear at a glance. The steel boom in the last figure is 100 feet long. A similar machine in Dayton will carry a boom 135 feet long. Standard machines of this type are built with booms 150 feet long. The lower end of the boom is at such a distance from the center on which the dragline platform swings that the bucket can be dropped vertically from the boom end to a distance from the center of rotation a trifle greater than the length of the boom—in the last instance 150 feet. This means that this drag ine can drop its load anywhere inside a 300-foot circle (except, of course, in the small circle the machine itself stands on). But a skillful operator can do better than this, and does so often in practical operation. By drawing the bucket close up with the loading cable, and then giving it a strong pull and quick run out and up with the hoist-cable, while the other runs loose, he can throw it from ten to forty feet beyond the boom end, the principle being the same as that by which a trout fisherman casts a fly. Figure 39 shows this. The bucket, after its quick run up and out, appears just in the act of striking the surface of the river. It is probably fifteen feet beyond the end of the boom. The picture was taken at Taylorsville. The dragline on that day was dredging in twenty feet of water, having already excavated ten to fifteen feet of river silt, for the cut-off trench, which here crosses the river. Greater depths could be reached if necessary, the depth varying with the material, size of machine and topography. In clay a machine of the size shown can excavate to a depth of 35 to 40 feet below the ground it stands on; in looser material, like the silt in question, considerably deeper. The machine in the picture had just reached hardpan and could go no deeper without blasting.

The advantage of the dragline over the steam shovel in reaching wide and deep is very marked. No steam shovel of such a size could possibly stand

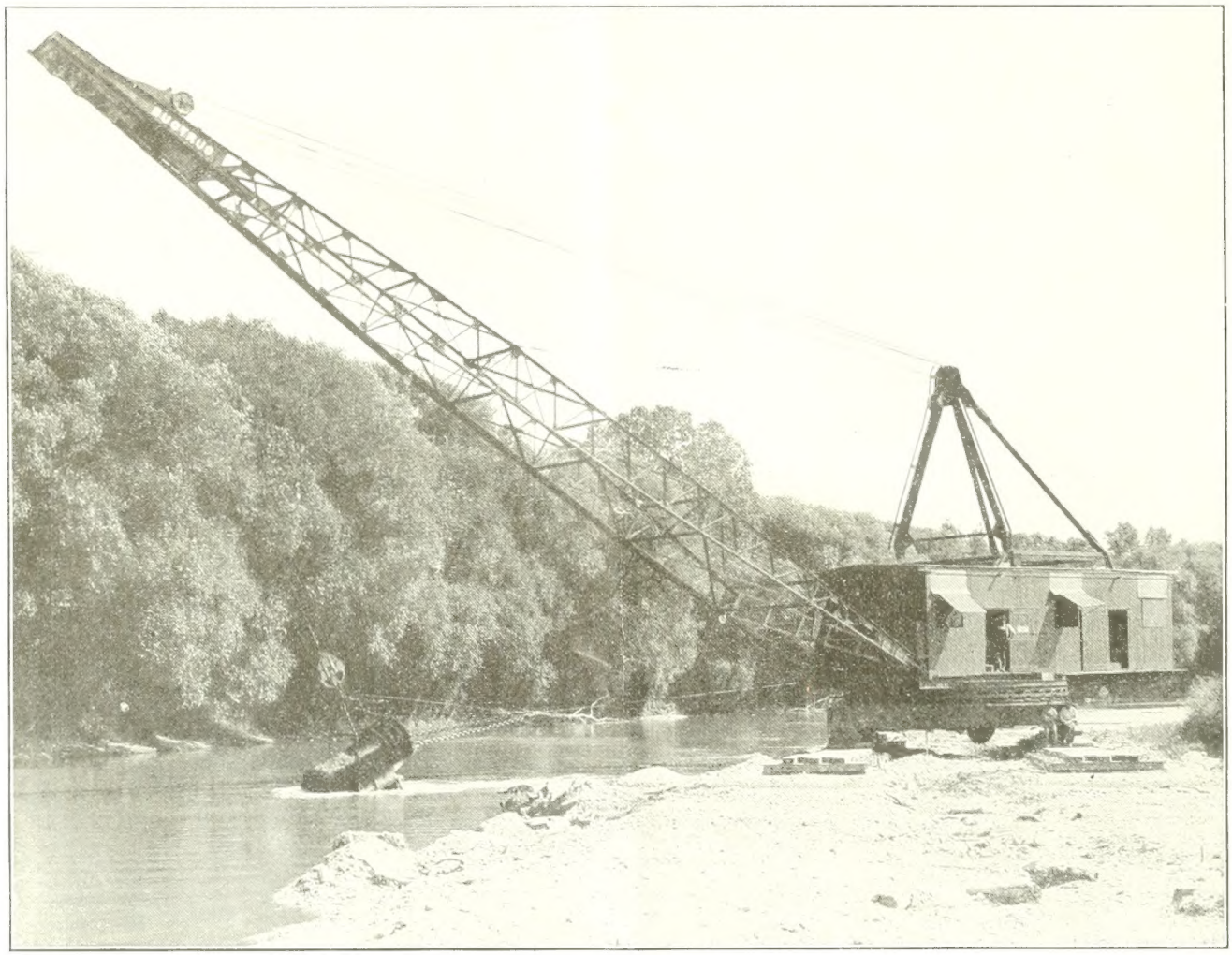


FIG 43—DRAGLINE BUCKET COMING UP FROM BOTTOM OF THE MIAMI RIVER WITH A LOAD

This is at Hamilton. The bucket is being pulled toward the machine, mouth foremost, by the loading cable, (the horizontal cable). Inside the house the other end of the cable is winding up on a steel drum hitched to a 250 horse power electric motor. The hoisting cable (at the left) is just beginning to hoist the bucket into the air.

Notice the bridle cable running from the nose of the bucket up over the small pulley and down to the loading cable, and how it keeps the nose of the bucket thrown up in the air, so as not to spill the load as it is hoisted (operating like the check rein on a horse). When ready to dump, the loading cable, heretofore taut, is let run, the bucket front drops mouth down, and the load drops out.

on the shore like the Lidgerwood just looked at, and touch even the water below its boom end, to say nothing of going beyond the boom and down to the bottom. To increase the advantage, the dragline has a boom much longer than the steam shovel of corresponding bucket capacity. The Lidgerwood boom just noted is 100 feet long. The corresponding steam shovel boom is 60 feet long.

done, the combination being facilitated by the fact that both steam shovels and draglines use three sets of engines or motors to produce the various motions needed. By substituting a steam shovel boom and dipper for the dragline boom, bucket and cables, the dragline is converted into a steam shovel. The Class 36 Marion Draglines used on the Conservancy work are combined machines of this type. For road

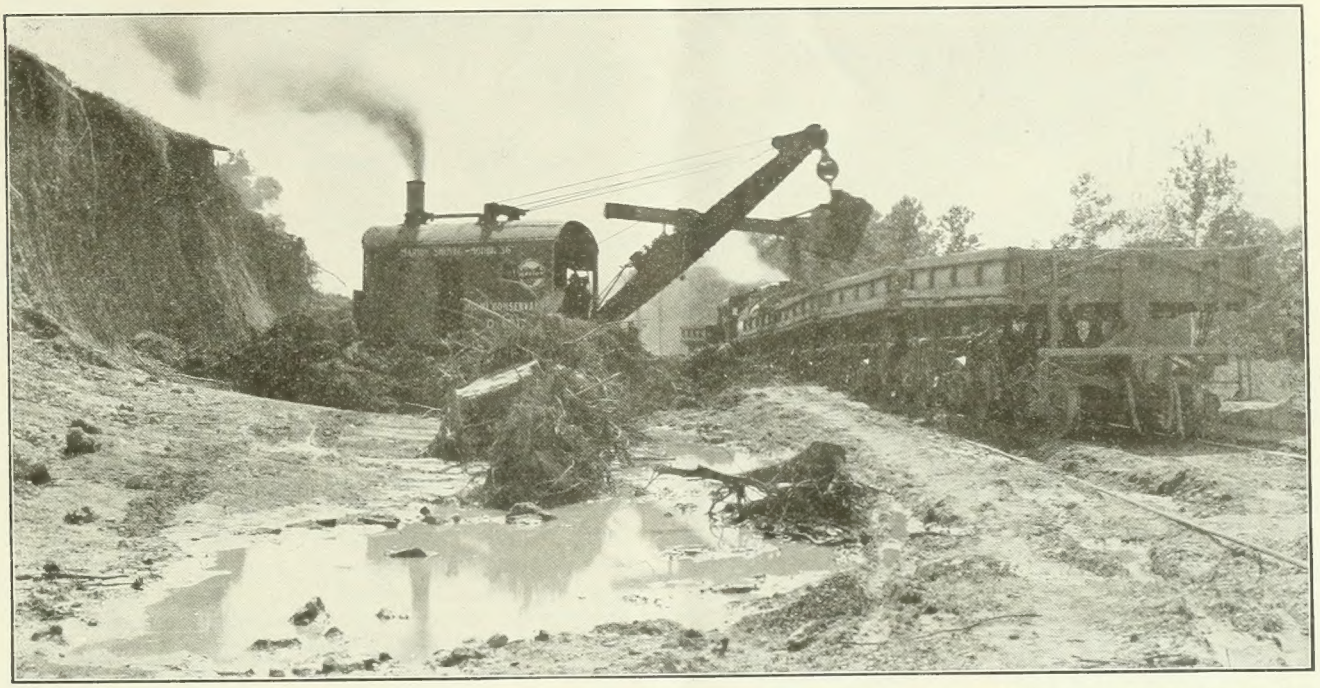


FIG 44—MARION MODEL 36 STEAM SHOVEL EXCAVATING THE EAST BANK OF THE MIAMI AT TAYLORSVILLE

The process is described in the text. See page 39

For river and levee work the dragline is, taken all round, the best excavator known. Its flexibility and wide range are highly advantageous. If it cannot reach material from the bank, it can go out into the river to get it. If necessary it can go on to the other side. It does this by pushing a peninsula out from the bank into the stream ahead of it, built of material which it scoops out on each side, and drops in place. It then picks up its timber "mats," or platforms, on which it travels, lays them down in front, hooks its bucket into the river mud in front, like a ship anchor, and pulls itself ahead out onto the peninsula. Arrived at the tip, it reaches back and scoops up the earth of the peninsula neck, which it deposits in front, leaving itself perched on an island in mid stream. From this point of vantage it excavates the bottom in reach to the desired depth, and then pushes on across, building the island on ahead, and picking it up behind, till it reaches the farther shore. The powerful draglines working in Dayton have crossed the Miami River in this manner several times.

For excavating in a bank or cut, however, a steam shovel is superior to a dragline. The dragline can do the work, but not so well. The steam shovel dipper being mounted on a compact solid arm can swing and dig more quickly. Each machine having thus its superior points, it would clearly be a good thing to combine the two. This has in fact been

building and railway building they have been used as steam shovels; for gravel pit and river work, they have been used as draglines. Another advantage of these machines is that they are mounted on caterpillar traction, such as is used by the tanks along the battle lines in France. The essential feature of caterpillar traction lies in the two moving platforms, one on each side, on which the machine travels, and which are the substitute for wheels. These give so broad a bearing that such a machine will travel without miring or stalling even in a soft, wet marsh. No track has to be laid in front of these machines or picked up behind them. They are ready to move at any time by throwing a clutch and opening a throttle.

An advantage of the dragline not mentioned is that by means of it transportation by car or barge is often obviated. The material instead of being loaded on a car or barge is dropped by a dragline in a heap as far as possible in the direction in which it is desired to carry it. The dragline then walks around the heap to the other side, picks it up again bucket by bucket, and drops it where it is wanted. The reach of the dragline, as explained, being so wide, a large size machine, such as many of those in the District, can thus by twice handling the material, deliver it at a point four hundred feet or more from its original position. Along the Miami River this method is

FIG. 45—DRAGLINE DIGGING A TRENCH IN THE BED OF THE MIAMI RIVER AT DAYTON

Shows clearly how the bucket loads. The loading cable (at the right) is pulling it toward the machine. The hoisting cable (above) lifts on the rear end just hard enough to tilt the lip (not seen, being under water), and cause it to dig in and fill the bucket with earth. By adjusting the pull on the hoisting cable, the bucket can be tilted at any desired angle to take its load. The dragline will build a dam on each side of the trench, and across it at the river end, with the excavated earth. An electric pump (the motor being in the little house at the left) will then pump out the trench water, and pipe will be laid in the trench bottom to carry compressed air across the river.

being largely applied. The long bank of earth, extending up the river from Herman Avenue Bridge in Dayton, is an excellent example. The dragline travelled down the river, deepening the channel along the west edge, picking up materials from the river bottom on one side and dropping it eastward in the bank on the other. Arrived at Herman Avenue Bridge, this dragline will pass around the end of the bank and travel up stream on the other side of it, picking up earth from the bank and depositing it in its final place still farther eastward.

It will be clear from a consideration of the foregoing why the dragline was chosen for so much of the work in the Conservancy District. Whether at the dams or in the river, much of the excavation had to be carried on below water level, either in the river or in the borrow pits along the valley bottom, in places which a steam shovel could never have reached. Moreover, the material as a whole had to be moved farther than a steam shovel could move it. The dragline has thus been the main excavating mechanism relied upon. For the railway work and in part of the work at the dams, it is supplemented by the steam shovel, where the latter has the advantage in speed, as has been above explained. For placing the hydraulic fill in the dams, it has been supplemented also by the dredge pump.

Organization of the District for the Liberty Loan

Organization of the Conservancy Committee for the Fourth Liberty Loan was effected on Wednesday, September 18, at the Headquarters Office. The drive will be in general charge of G. H. Matthes, Office Engineer, and L. F. Wilcock, Assistant Engineer. These two will also handle personally the work in Dayton. One or two committeemen, appointed to direct the work at each construction camp, on the railway relocation, and in Hamilton, will give any information necessary. Their names will be found at the foot of the advertisement on the outside back cover page of the Bulletin. The Conservancy drive will fall in line with the work of the local authorities everywhere. Germantown, Englewood and Taylorsville camps will work with the Montgomery County Committee. Similarly, the Huffman camp, and Mr. Sprague at Osborn, will co-operate with Greene County, Lockington camp with Shelby County, and the Hamilton office with Butler County. Joint meetings will be held, at which county committee speakers will address the men at the camps; and each township will receive and handle the funds, and receive credit for the work done, at each Conservancy center within its limits.

At the same time the Conservancy drive, while interlocking with all others, will keep its own separate organization, receive and distribute its own reg-

ular reports from all its locals, keep a tally sheet of every Conservancy contribution, and properly accredit each to the source from which it comes. There is going to be a friendly race, a handicap race, based as it ought to be on the payroll, in which every Conservancy center is going to be a contestant. The relative standings will be bulletined every day at every center. Every committeeman in the District is going to buckle down to see that his camp wins. Lockington led the bunch on the War Chest fund. With this scheme working, we feel safe in predicting that it will have to go a lot faster if it expects to win on the Liberty Loan. Englewood has carried a chesty swing for some time over its pep on construction. It will have to steam up on Liberty Loan or get left. There is hard work ahead —and loads of joy for the spectators.

Hearty acknowledgments are due Mr. Bernis Brien, Liberty Loan Sales Director for Montgomery County out of Dayton, for his inspiring aid. Messrs. Matthes and Wilcock are going into the work with energy and the campaign opens with many signs of promise. Chief Engineer Morgan, Mr. Paul, the Assistant Chief, Mr. Locher, the Construction Manager, and Mr. Kuhns, the Secretary of the Board of Directors, have all pledged not only their heartiest co-operation, but their funds to the limit.

September Progress on Conservancy Work

GERMANTOWN

During the first half of the month the coal unloading hopper was completed and put into operation. The motors were set in the concrete plant and final adjustments made to the machinery. The plant is now ready for operation. The excavation for the outlet works has progressed throughout the month, the portion for the lowest part of the hydraulic jump being completed. As an average 750 cubic yards of material have been moved per day.

Work has been carried on throughout the month on the roads, but the excessive rains have put them in very poor condition. A rainfall of 3.75 inches has been recorded between the first and 18th of the month.

Carpenter work on the camp cottages has been 95 per cent completed and the coal sheds are nearly completed. Most of the cottages are occupied. The schoolhouse has been built and will be ready for occupancy in another week.

A piano has been purchased, for use in the community house, by a donation from the employes.

A. L. Pauls, Division Engineer.

ENGLEWOOD

The conduit excavation by means of the dragline has progressed to a point about 100 feet beyond the center line of the dam. This means that the excavation for this structure is considerably more than half done.

Concreting has progressed steadily and the bottom and steps of the main pool at the outlet are about completed. Forms for both weirs at the outlet, and for conduit sidewalls are being erected.

The 48-in. pipe line from river to sump for hydraulic pumping, together with wet well, sluice gate, etc., are completed.

One dragline is excavating in the main borrow pit and another is spreading material in the end dam to retain the hydraulic fill.

The blanket of impervious material on the upstream side of the dam, contracted for with Ward Bros., is completed.

The work on cottages, camp roads, etc., is nearing completion.

A track has been graded for bringing impervious material to the end dam from the spillway excavation.

H. S. R. McCurdy, Division Engineer.

LOCKINGTON

The present season's work at Lockington is centered on the concrete outlet works, through which Loramie Creek will flow when the dam is finished. Progress on this is satisfactory. The Class K Lidgerwood electric dragline has excavated 65,000 cubic yards of earth and gravel, laying bare the bed rock for most of the concrete outlet foundations. About two-thirds of this material is gravel, which has been stored in a pile to be used in the concrete, of which there will be about 38,000 cubic yards. The gravel washing plant is completed and gravel is being washed and screened for use in concreting the foundations, now in progress. The first concrete was poured August 10 at the upstream end of the inlet channel. Up to September 23 about 2,500 cubic yards had been placed, the largest single day's run being 182 cubic yards. This was in the retaining wall. Movable wooden forms, in panels 27x16, are handled by two guy derricks with 120-foot masts and 100-foot booms. Concrete is hauled in bottom dump buckets on small flat cars by a gasoline dinkey. Bed rock is grouted before concrete is poured on it to insure against fissures or cavities.

To protect the construction against possible high water a levee has been built north of the entrance channel. Machinery for repair shops has been installed. Electric power is supplied from Piqua and Dayton.

B. M. Jones, Division Engineer.

TAYLORSVILLE

The installation of the dredge pumps and the water pumps, to be used for washing down and sluicing the material for the hydraulic fill, is well under way. The pumps are expected to be in operation within a month. The end dam next the west bank of the river, for retaining the hydraulic fill, is progressing favorably. The fill can be started as soon as the dredge pumps are ready. The excavation of the cut-off trench on the east side of the river is well begun, and the dragline now engaged upon it will soon be at work on the cofferdam for the outlet conduits. The bins for the gravel washing plants are nearly completed and the installation of the machinery can be started soon. The sewer and water systems for the camps, including the sedimentation tank, have been completed, and are in full operation. A camp telephone system is also

nearly complete. Five new cottages have been built to supply the increased demand, and the hospital and schoolhouse are progressing. One thousand feet of permanent road and 2,000 feet of temporary road have been constructed.

O. N. Floyd, Division Engineer.

HUFFMAN

All the buildings and other features in the original plan for the Huffman Camp have been completed, and all occupied with the exception of a few cottages that are reserved for employees who are coming to the job in the near future. Three cottages have been added to the original plans and are under construction.

All prepartions for beginning work on the outlet works have been made, so that actual work can be started within a few days after the Big Four Railroad tracks are moved to their temporary relocation. The gravel washing and screening plant for the 12,000 cubic yards of concrete required has been built. The large electric dragline, that will make the 180,000 cubic yards of excavation for this concrete work, has been erected, and the construction tracks for the disposal of the excavated material have been laid.

A part of these concrete outlet works will be placed in the present bed of Mad River, so that it has been necessary to divert the river channel for a distance of 2,000 feet. The diversion channel required the excavation of 24,000 cubic yards. This has been completed. 10,000 cubic yards of material has been placed in earth dikes across the old river channel above and below the location of the outlet works, and along the river bank, to protect the work from high water during its construction.

Nine thousand cubic yards of material have been excavated from the cut-off trench. This material has been assorted and placed in its proper place in the permanent embankment for the dam. 3,300 cubic yards of additional selected material has been placed as rolled embankment to form an impervious blanket under the upstream half of the dam.

Twenty-two thousand cubic yards of soil stripping have been removed from the base of the dam.

C. C. Chambers, Division Engineer.

FIG. 4 — TRENCH TO NEW CHANNEL FOR TWIN CREEK AT GERMANTOWN

Showing where the creek will run after the dam is completed. The stream appears still flowing in its old bed, just beyond. The excavation for this was made just at this time in order to get gravel for the concrete of the conduits. The work of excavation thus serves a double purpose.

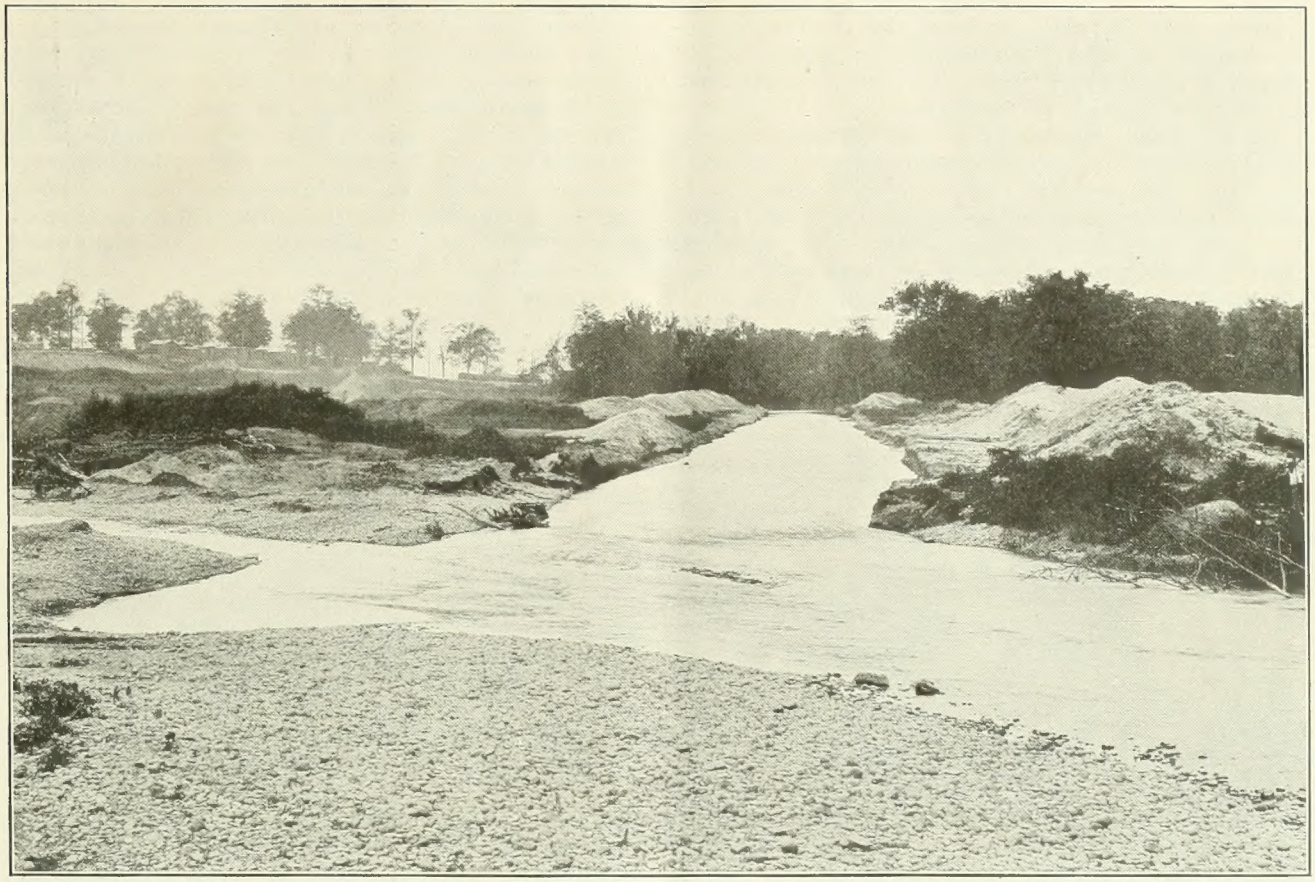


FIG. 47—THE DIVERSION CHANNEL AT HUFFMAN

The concrete outlet structure being best located in the bed of Mad River, the stream had to be diverted in order to permit its construction. A new river bed was dug by one of the big Lidgerwood dragline excavators, and the stream turned into it. The result appears in the center of the picture. The river at the right still keeps its original channel; then turns and flows straight away down the new bed as seen. The narrow inlet at the left marks the old bed. The banks of earth on each side were dug from the new bed.

HAMILTON

The old Fort Hamilton Mill building has been cleaned out and remodeled for an office. This work was begun on March 23 by the F. K. Vaughn Building Co. and completed on April 9. Four large rooms were partitioned off and part of the building is used as an electrician's shop. This building is centrally located just south of the Monument and makes a very convenient office. The brick livery stable, just south of it, formerly occupied by Ross and Jenkins, has been equipped as a warehouse, shop and garage.

The first equipment for the Hamilton job, consisting of part of the Class 24 electric dragline, arrived on March 24, and the work of unloading and erection was begun at once. Erection was done entirely by hand. The machine started moving June 8 and began actual excavation on June 24. Since then it has dug a channel one mile long, 45 feet wide on the bottom and from 5 to 20 feet deep, having moved a total of about 130,000 cubic yards.

The first construction work was on the electric power transmission line, on March 18. It was completed and the power turned on and tested on June 7. The power is obtained from the Champion Coated Paper Co. The line crosses the river opposite Vine Street and runs down the east bank to a point opposite the north end of Riley's Island, thence crosses to the island and continues to the south end of same, a total length of 3.1 miles. About 50,000 feet of No. 2-0 copper wire was used.

Erection of the Class 14 Bucyrus dragline was begun about June 1. Since its completion this machine has graded an area of about 100 feet by 500 feet for storage yard, built about 3,000 feet of railroad embankment from 10 to 18 feet high and built about 700 feet of levee and diversion channel for supplying water to the O. E. power station, the former supply from the river having been cut off by the work of the other dragline in lowering the river.

Work was started on the Buckeye Street sewer on August 8. This is a concrete sewer with a vertical diameter of 5 ft. 8 in. and horizontal diameter of 5 feet; depth of trench about 25 feet. Concreting was begun on August 24, the outlet walls and 40 feet of arch being now completed. About 200 feet of trench have been dug to grade, this being the most difficult section, as it passes under the Hamilton and Rossville Hydraulic canal and a number of old building foundations west of Front Street. The construction plant for this job consists of a derrick of 28 feet gage, 30 feet boom, and 55 h. p. hoist; a Smith ½-yard concrete mixer; a Plymouth gas locomotive; and four 1½-yard Western rocker dump cars.

C. H. Eiffert, Division Engineer.

DAYTON

About 21,000 cubic yards of the levee embankment above Island Park have been placed. The levee is practically completed to a point about 2,000 feet east of the New Troy Pike.

On the main channel work near Herman Avenue Bridge, 47,000 cubic yards of embankment have been placed in final position. About 174,000 cubic yards of excavation have been handled, 31,000 cubic yards of which have been moved twice. Nine hundred lineal feet of cast iron water main and compressed air pipe have been uncovered and relaid in the river channel. About 800 lineal feet of the completed levee south of Herman Avenue Bridge has been seeded. Four timber deck scows have been launched from the shipyard at Herman Avenue as follows: one 8-foot by 18-foot scow for general use, one 40-foot by 80-foot scow to be used for mounting dragline excavator, and two 40-foot by 120-foot scows for transportation of excavated materials. A third 40-foot by 120-foot scow will be ready for launching before the end of September. As soon as this is in the water, construction will be started on a 20-foot by 70-foot stern paddle wheel steam tug, which will be used in transporting the scows.

The temporary dam under construction at the mouth of Wolf Creek is about 25 per cent completed.

A. C. Bock, Division Engineer.

THE RAILWAY RELOCATION

Erie and Big Four—One steam shovel is working day and night in the big cut at Huffman Hill. Highway changes east of the dam and near Mud Run, are practically completed. The grading on the Enon end of the railroad work will be completed within a few days and the outfits will be moved into the 20,000-yard cut on the J. H. Stevens farm, southeast of Fairfield. The channel change in Mad River to provide a new inlet for the Harshman Improvement Co's. canal has been completed, the old channel having been filled by the new railroad embankment.

The masonry work on the Springfield Pike underpass is nearing completion and the steel work will be delivered soon. Three concrete culverts have been completed. Six others are well under way; also one concrete bridge. The Big Four temporary track is about 95 per cent completed and would be entirely finished had not the railroad contractors suspended work upon it. The Ohio Electric temporary bridge has been completed and traffic is now operating on the new line.

Baltimore & Ohio—Both Kahl Bros. and McAndrews have about finished their grading.

The Vang Construction Co. has completed the cut immediately south of Poplar Creek and their shovel is now working in the 135,000-cubic yard cut just north of Johnson Station. Their upper shovel has finished the grading up to the Taylorsville Dam and has been moved to the 20,000-yard cut about three miles below it. The excavation for the highway undercrossing at Johnson Station has been finished and the footings concreted. The same is true for the 30-foot arch at Poplar Creek.

Condon & Smith have one large steam shovel working in the big cut north of the Taylorsville Dam and are now making good progress. They have a good layout and their tracks are in excellent condition. The Condon Bros. steam shovel has excavated about 25,000 cubic yards and is now working in a 15,000-yard cut about four miles above Taylorsville.

Miller Bros. have completed two concrete culverts north of Tadmor, and are making good progress on the 26-foot arch at Picayune Creek.

All of the railroad construction work has been very much delayed during the month due to the heavy rains.

E. N. Floyd, Division Engineer.

War Service Notes

Mr. Dickson, Secretary of the Dayton Y. M. C. A., who has just returned from France, reports that Captain W. P. Watson, formerly of our engineering staff, is in charge of a training school for heavy artillery located near Paris. These big guns are mounted on caterpillar tractors, like the tanks. The smaller draglines used on the Conservancy District are mounted in the same way, and move over the ground in the same manner. Captain Watson's superior officer told Mr. Dickson that he considered the Captain a great find. It had been a relief to turn over the management of the school to so good a man. We are glad to learn also that A. A. Ort, formerly the District's Assistant Office Engineer, has been placed in entire charge of transportation at the Philadelphia Navy Yard. With Philadelphia as the headquarters of the United States Ship Building Corporation, and the location of the biggest ship building plant in the world, Mr. Ort has a real job. We have always thought the District was able to choose good men, and are pleased to see its judgment corroborated by the authorities of the United States Navy.

The Bulletin was pleased to receive a call on September 12 from E. W. Lane, formerly of the Conservancy District. As Assistant Superintendent of Construction, he has been in charge of sewerage waterworks, drainage and road work just completed at Dorr Aviation Field, Arcadia, Florida.

Myron Cornish, who was formerly with the Conservancy, has been since March at Riverside, California, as Assistant Superintendent of Construction, on the March Aviation Field. The work there has just been completed and Mr. Cornish is awaiting further orders.

The Bulletin was glad to receive a call, on September 5th, from Second Lieutenant R. F. Herdman, formerly with the District, who has just finished his training in the United States Artillery School at Camp Taylor Kentucky. He did not then know where he would next be stationed.

W. R. Mounts was lucky enough to be transferred overseas after only three weeks' training.

Seen and Heard on the Job

THE LABOR DAY PICNIC

The Picnic at Englewood on Labor Day was a pleasant and successful affair. Representatives from all of the camps were present. The forenoon and early afternoon were spent in looking over the work at Englewood and the cottages there, many of which are now occupied. The dinner at the mess hall, served under the personal direction of Mr. McCarthy, Chief Steward for the District, was an uncommonly well cooked and palatable meal, and reasonable in price. More than a hundred and forty people were served. Others brought their own lunch in baskets.

The games of the afternoon, under the direction of Messrs. Chandler and Everhard of the headquarter's office, proved the most enjoyable feature of the occasion. Men, women, and children took part, including the chief engineer and the wife of the construction manager. The athletic events indeed made of the picnic a family affair, full of fun and informality, the children's and ladies' races contributing not the least to these features. The winners were as follows:

Three-Legged Race—Messrs. Zull and Sylvester of Dayton.

100 Yard Dash—Horton of Englewood.

Fat Man's Race—Chief McIntosh of the Dayton Shop.

Special Challenge Race—Chief McIntosh vs. Chief Engineer Morgan. Won by Mr. Morgan.

Special Challenge Race—Division Engineers. Jones of Lockington, and McCurdy of Englewood. McCurdy won by a nose.

Small Boys' Race—Valentine Stock of Englewood.

Little Girls' Race—Myra Saltmarsh.

Larger Boys' Race—Ernest Morgan.

Ladies' Race—Mrs. Porter-Shirley and Miss Sayler. Tied.

Tug of War—Blondes vs. Brunettes. Won by the Blondes. (They stripped the "Brunettes" off the rope against a tree like beads off a string.)

Obstacle Race—Sylvester of Dayton.

The whole affair was under the supervision of Mr. C. W. Porter-Shirley, General Camp Overseer. Mr. Porter-Shirley wishes to return thanks to all who contributed to the success of the picnic. It is not knocking anybody else to add, what we are sure all concerned feel, that special thanks are due to Messrs. Chandler and Everhard for their successful staging of the athletic events, which made of the picnic a genuinely get-together occasion. It is hoped and expected that this will be only the first of a number of such affairs.

Population Note. On August 26 an eight pound girl was born to Mr. and Mrs. O. N. Floyd of the Taylorsville Camp. On September 1 an eight pound boy came to Mr. and Mrs. N. A. Paggeott of Huffman. Beaten by five days, Huffman consoles itself by boasting that nevertheless Huffman had the first baby born right on the job at any camp, the Floyd infant having appeared at the Miami Valley Hospital. The Bulletin congratulates all four of the p. ps.

NOTICE TO CONSERVANCY EMPLOYEES

In order to relieve the automobile situation and save expense, will you kindly notify L. F. Wilcock, Headquarters Office, whenever you leave Dayton by automobile, advising him when and where you plan to go?

This will frequently enable sending out one machine where otherwise two or three would be going to the same locality about the same time. Also, parties desiring to go to our various projects can be thus taken care of, saving considerable annoyance and cost of operation.

All parties not having the use of District automobiles should communicate with the Headquarters Office whenever they wish to make a trip, making their wants known in ample season, so that arrangements for their transportation may be made.

ARTHUR E. MORGAN,
Chief Engineer.

FLAG RAISING AT TAYLORVILLE DAM

An impressive program was carried out recently at Taylorsville, when all the workmen gathered around the newly erected flag pole, to do honor to the new camp flag. Two large flags were purchased by the workmen, who donated so liberally that the fund over ran the price of the flags by $19.22. This amount will be retained as a start towards a general welfare fund.

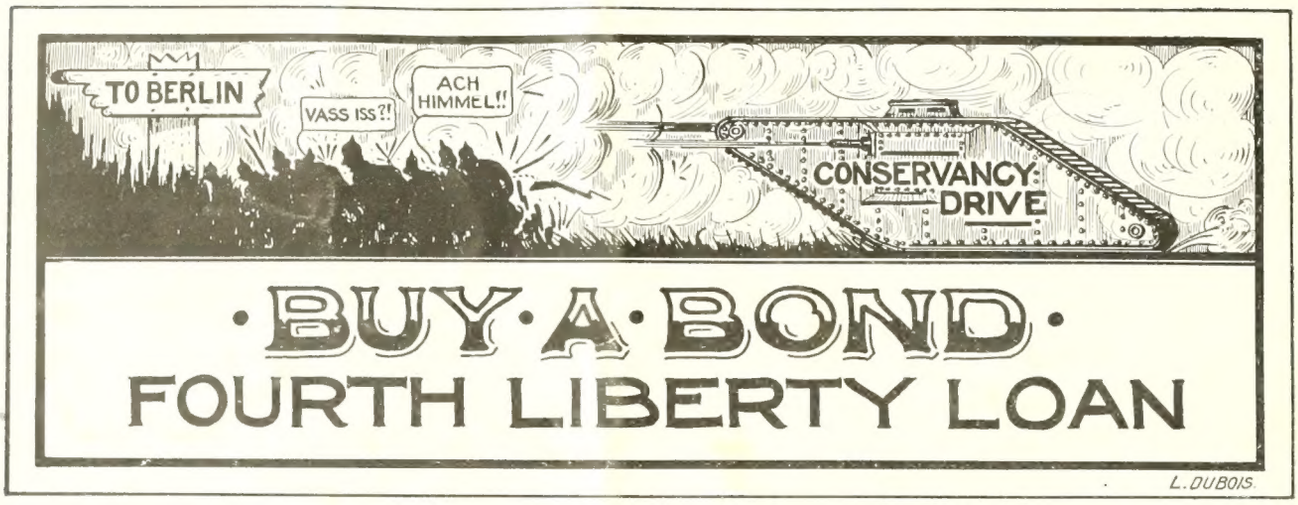
Division Engineer Floyd opened the program with a few appropriate remarks, and introduced Chief Engineer Morgan, who gave a short talk. He dwelt on the importance of winning the war, and the kind of life we are fighting for. He outlined the principles of a true democracy and explained the position of the Conservancy District, its work being listed as a war project, which will protect the war industries that are located in the Miami Valley. Mr. Morgan emphasized the importance of co-operation among the workmen at the camp in making living conditions the best possible. He urged the men and women to take advantage of the educational opportunities that will be offered at the camp, in the way of lectures and night school classes, all this being important to the highest standard of efficiency and service.

The school children were ready with their pa of the program. They sang America, after whi Mr. Rogers raised the flag which floated out a the cheers of every man, woman and child of camp.

E. A. Berkley, Camp Over

H. L. Rodgers, of the headquarters office, married on September 3 to Miss Laura Mint Pleasant Hill, Ohio, and of Oregon. The B extends congratulations and kindest wishes.

Mr. George P. Ellis, member of the firm of ner, Gilman and Ellis, Certified Public Accou was in Dayton September 20, looking after the ing of the Conservancy books, which has be progress for four months. This audit is no proaching completion and the results will be with the Conservancy Court in the near fu



The First American Army Under General Pershing Struck at St. Mihiel Two Weeks Ago. In Just Twenty-Seven Hours They Had Wiped the Salient Out. American Shells Are Now Falling on the Great German Fortress of Metz, the Key to the Rhine Valley.

On September 26 the Americans Struck the Second Blow, in the Champagne. They Advanced Seven Miles in a Day—and Are Still Going. 2,000,000 Americans Are Now in France—On the Way to BERLIN!

Next Spring There Will Be Four Millions of Them—Five Millions—Six Millions—Ten Millions if Ten Millions Are Needed—On the Way to BERLIN!

Will You Back Them?
Silver Bullets Must Help the Steel Shells
Shoot Yours!—Buy a Liberty Bond!

Besides doing the boys "over there" $50 or $100 worth of good right now when hey need it, it does this for you:—

1. It lays up $50 or $100 against a rainy day—for **you**, your wife, your child—in safe keeping of the United States Government—the solidest government in the ld.

2. The United States will pay you interest on it at 4¼ per cent.

3. The fund which it lays up you can **cash in on at any time.**

ndependently of helping the boys "over there," doesn't it look like common sense y one, just for your own benefit?

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e Following Persons Will Sell Bonds:——At Dayton, G. H. Matthes, Office Engineer, and L. F. k——At Germantown, Alex. Mackinnon——At Englewood, H. S. R. McCurdy and C. C. Williams t Lockington, C. H. Shea——At Taylorsville, E. A. Berkley——At Huffman, Dr. J. M. Sayler—— Hamilton, R. B. McWhorter——On the Railway Relocation, F. H. Sprague.